

AMENDMENTS TO THE CLAIMS

Claims 1-22 (Cancelled)

23. (Currently amended) A multidirectional input device comprising:
an insulating substrate;
a ring-shaped resistance element layer formed on said insulating substrate, said ring-shaped resistance element layer having ~~more than two~~ a plurality of electrodes disposed thereon;
a plane substrate spaced from said resistance element layer by an insulating space;
a ring-shaped conductive section disposed on said plane substrate;
an operating section operable to bring said resistance element layer into partial contact with said conductive section; and
a controller,
wherein said ring-shaped conductive section comprises a plurality of conductive layers insulated from each other by insulating sections,
wherein said insulating sections oppose said plurality of electrodes,
wherein said resistance element layer is operable to receive a voltage,
wherein said operating section is further operable to press one of said insulating substrate and said plane substrate so that said resistance element layer comes into partial contact with said conductive section, and
wherein said controller is operable to detect a contacted position between said resistance element layer and said conductive section using a signal supplied from said conductive section.

24. (Currently amended) The multidirectional input device of claim 23,
wherein said insulating substrate comprises a flexible insulating substrate having an upper surface and a lower surface,
wherein said ring-shaped resistance element layer is formed on said lower surface of said flexible insulating substrate ~~and has a plurality of electrodes at given positions,~~

wherein a circumferential width of each of said insulating section is narrower than a circumferential width of each corresponding one of said plurality of electrodes,

~~wherein said conductive section comprises a first conductive layer and a second conductive layer insulated from each other,~~

wherein said operating section comprises a ring-shaped protruded section and a knob,

wherein said protruded section is spaced from said upper surface of said flexible insulating substrate by a distance,

wherein said knob is operable to tilt in an arbitrary direction with respect to a center of a lower surface of said operating section,

wherein said knob is operable to tilt in an arbitrary direction with respect to a center of a lower surface of said operating section,

wherein said plurality of electrodes are operable to receive a voltage,

~~wherein when said knob tilts, said protruded section bends a part of said flexible insulating substrate so that said resistance element layer contacts one of said first conductive layer and said second conductive layer for conduction, and~~

wherein said protruded section bends a part of said flexible insulating substrate when said knob tilts so that said ring-shaped resistance element layer contacts a first conductive layer of said plurality of conductive layers and a second conductive layer of said plurality of conductive layers for conduction, and

wherein said controller is operable to determine a tilt direction of said knob based on output voltages supplied from leads of said first conductive layer and from leads of said second conductive layer.

25. (Currently amended) The multidirectional input device of claim 24,

wherein said ring-shaped resistance element layer has a uniform resistivity and a uniform ring-width, and

wherein said plurality of electrodes are separated by an equiangular interval. ~~interval and are disposed at a distance from a center of said ring-shaped resistance element layer, and~~

~~wherein said first conductive layer and said second conductive layer are insulated from each other by insulating sections corresponding to said plurality of electrodes.~~

26. (Currently amended) The multidirectional input device of ~~claim 23~~, claim 24, wherein the plane substrate is comprises a conductive metal substrate functioning as said conductive section, and

wherein said controller is operable to sequentially select two of said plurality of electrodes to receive a voltage.

27. (Currently amended) An electronic apparatus comprising:
a top casing having a through-hole, said top casing being used as covering-material of said electronic apparatus;

a flexible insulating substrate;

a plane substrate;

a controller; and

a multidirectional input device having a ring-shaped resistance element layer formed on said flexible insulating substrate, a ring-shaped conductive section disposed on said plane substrate, which is spaced from said ring-shaped resistance element layer by an insulating space and an operating section operable to bring said resistance element layer into partial contact with said conductive section,

wherein said ring-shaped resistance element layer has ~~more than two~~ a plurality of electrodes disposed thereon, and

wherein said ring-shaped conductive section comprises a plurality of conductive layers insulated from each other by insulating sections,

wherein said insulating sections oppose said plurality of electrodes,

wherein said controller is operable to detect a contacted position between said resistance element layer and said conductive section using a signal supplied from said conductive section.

28. (Currently amended) The electronic apparatus of claim 27,
wherein said insulating substrate comprises a flexible insulating substrate,
wherein said ring-shaped resistance element layer is formed on a lower surface of said flexible insulating substrate, ~~and has a plurality of electrodes at given positions;~~
wherein a circumferential width of each of said insulating sections is narrower than a circumferential width of each corresponding one of said plurality of electrodes,
~~wherein said conductive section comprises a first conductive layer and a second conductive layer insulated from each other;~~
wherein said operating section comprises a ring-shaped protruded section and a knob,
wherein said protruded section is spaced from an upper surface of said flexible insulating substrate by a distance,
wherein said knob is operable to tilt in an arbitrary direction with respect to a center of a lower surface of said operating section,
wherein said plurality of electrodes are operable to receive a voltage, and
wherein when said knob tilts, said protruded section bends a part of said flexible insulating substrate, so that said resistance element layer contacts ~~one~~ a first conductive layer of said ~~first conductive layer~~ plurality of conductive layers and ~~said second~~ a second conductive layer of said plurality of conductive layer layers for conduction.

29. (Previously presented) The electronic apparatus of claim 28,
wherein said plane substrate comprises a plane printed circuit substrate of said electronic apparatus, and
wherein an upper surface of said knob is exposed from the through-hole of said top casing.

30. (Previously presented) The electronic apparatus of claim 29, wherein said flexible insulating substrate comprises a flexible printed circuit substrate disposed above said plane printed circuit substrate.

31. (Previously presented) The electronic apparatus of claim 29, further comprising:
a resilient body placed between a lower surface of a section formed around the through-hole of said top casing and a flange operable to prevent said knob from separating from said electronic apparatus, said flange being formed of a circumference of said knob,
wherein the knob is operable to steadily hold at a position that is substantially normal to said plane substrate.

32. (Currently amended) The electronic apparatus of claim 27,
wherein said operating section is operable to tilt and slide, and
wherein said ring-shaped resistance element layer partially contacts with said ring-shaped conductive section by one of tilting said operating section and sliding said operating section, so that said controller detects an operating direction via a signal produced by the partial contact.

33. (New) The multidirectional input device of claim 23, further comprising:
a pair of spacers disposed between said plane substrate and said ring-shaped resistance element layer,
wherein one of said spacers is disposed on an internal periphery of said ring-shaped resistance element layer, and
wherein the other of said spacers is disposed on an external periphery of said ring-shaped resistance element layer.

34. (New) The electronic apparatus of claim 27, further comprising:
a pair of spacers disposed between said plane substrate and said ring-shaped resistance element layer,
wherein one of said spacers is disposed on an internal periphery of said ring-shaped resistance element layer, and
wherein the other of said spacers is disposed on an external periphery of said ring-shaped resistance element layer.